Demonstration 1 - Dimensional Instruments

ME3023 - Measurements in Mechanical Systems

Mechanical Engineering

Tennessee Technological University

Topic 1 - Using Calipers

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- Overview
- Components
- Vernier Calipers
- Digital Calipers

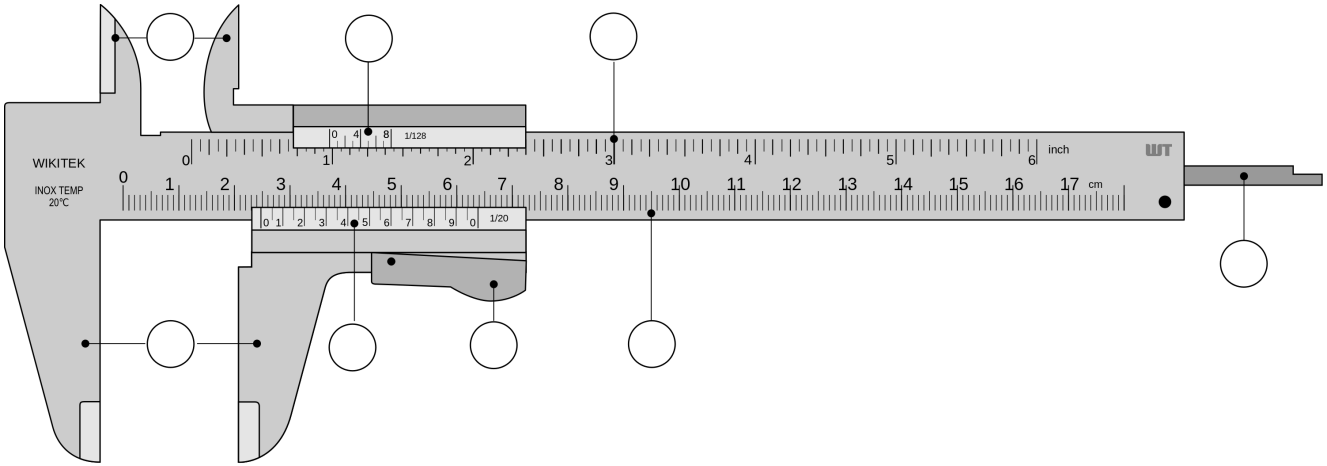
Overview

- A caliper (... a pair of calipers) is a device used to measure the distance between two opposite sides of an object. Text: Wikipedia
  - Length, Width, Height
  - Inside and Outside Diameter
  - Depth

- There is a wide variety of caliper(s). This word means different things in different fields.
  - Engineering and Deisgn
  - Machining and Construction
  - Medical Applications and Others

Components

Text: Wikipedia



1. - **Outside jaws**: used to take external measures of objects
2. - **Inside jaws**: used to take internal measures of objects
3. - **Depth probe**: used to measure the depth of objects
4. - **Main scale** (cm)
5. - **Main scale** (inch)
6. - **Vernier** (cm)
7. - **Vernier** (inch)
8. - **Retainer**: used to block movable part

Vernier Calipers

A vernier scale is a visual aid to take an accurate measurement reading between two graduation markings on a linear scale by using mechanical interpolation; thereby increasing resolution and reducing measurement uncertainty by using Vernier acuity to reduce human estimation error.

Pros

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Cons

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Vernier Calipers

Look at scale carefully and clean the jaws before taking a measurement. First read the main scale then add the measurement from the Vernier scale.

Digital Calipers

A digital caliper contains an embedded processor and user interface to facilitate the measurement process.

Pros

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Cons

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Digital Calipers

Make sure to clean the jaws and zero the instrument before you take a measurement. Also, be careful not to press the zero button on accident. On some models this is very easy to do.